

REMARKS

I. Introduction

By the present Amendment, claims 1, 5, 9, 10, 15, and 26 have been amended. Claims 4, 8, 13, 16, 23, 24, and 27-29 have been cancelled. Accordingly, claims 1, 5, 9, 10, 14, 15, and 26 remain pending in the application. Claims 1, 5, and 10 are independent.

II. Office Action Summary

In the Office Action of March 19, 2009, the Drawings were objected to under 37 CFR §1.83(a) as failing to show every feature of the invention specified in the claims. Claims 27-29 were subjected to a Restriction Requirement as being directed to an invention that was distinct from the originally claimed invention. Claims 8 and 9 were objected to under 37 CFR 1.75(c) as being of improper form. Claims 1, 4, 5, 8-10, and 13-16 were rejected under 35 USC §112, first paragraph, as failing to comply with the written description requirement. Claims 1, 4, 5, 8-10, 13-16, 23, 24, and 26 were rejected under 35 USC §112, second paragraph, as being unclear for failing to particularly point out and distinctly claim the subject matter regarded as the invention. Claims 23 and 24 were rejected under 35 USC §102(b) as being anticipated by U.S. Patent No. 5,472,603 issued to Schembri. Claims 1, 4, 5, 8-10, 13-16, and 26 were rejected under 35 USC §103(a) as being unpatentable over Schembri in view of U.S. Patent Application No. 2002/0047003 to Bedingham et al. ("Bedingham"). These rejections are respectfully traversed.

III. Objection to the Drawings

The Drawings were objected to under 37 CFR §1.83(a) for failing to show every feature of the invention specified in the claims. Regarding this objection, the Office Action indicates that the reagent containers having a dispensing mechanism must be shown or the features cancelled from the claims.

Applicants respectfully disagree with this objection, and request reconsideration and withdrawal thereof. As discussed in the Specification, a reagent dispenser (19) is provided for receiving a prescribed amount of reagent from each reagent bottle (400). See paragraph [0086] and Fig. 14. After the prescribed amount of reagent is dispensed into the reagent container, the analysis disk is rotated so that the reagent can flow. See Figs. 3 and 15. Thus, it should be readily appreciated that the reagent dispenser is already illustrated in the current figures.

Withdrawal of this objection is therefore respectfully requested.

IV. Restriction Requirement

Claims 27-29 were subjected to a Restriction Requirement as being directed to an invention that is independent or distinct from the invention originally claimed. The Office Action specifically indicates that the newly submitted claims are drawn to a device that comprises a main body, at least one analyzing disk mounted on the main body, a motor, a holding device rotatably supported by the motor, a plurality of analyzers provided on the holding device, an operating device mounted on the main body, and a hole forming device. The Office Action concludes that there is no unity of inventions, and has withdrawn claims 27-29 from further consideration as directed to a non-elected invention.

By the present Amendment, Applicants have cancelled claims 27-29, thereby rendering this particular issue moot.

V. Rejections under 35 USC §112

Claims 1, 4, 5, 8-10, 13-16, 23, 24, and 26 were rejected under 35 USC §112, second paragraph, as being unclear for failing to particularly point out and distinctly claim the subject matter regarded as the invention. Regarding this rejection, the Office Action indicates, for example, that claims 1, 4, 5, 10, 15, and 16 do not set forth clear structural interrelationships between the hole forming device and the rest of the elements of the claimed invention. Furthermore, the Office Action indicates that the side opposite to the rotation center is unclear because the claims do not define what the rotation center side is. Regarding claims 5, 9, 10, and 16, the Office Action indicates that "said periphery side of said capturing section" lacks antecedent basis. The Office Action further indicates that claims 8, 16, and 24 contain various phrases that remain unclear.

By the present Amendment, Applicants have cancelled claims 4, 8, 13, 16, 23, and 24, thereby rendering this particular ground of rejection moot. Regarding the remaining claims, however, Applicants have made various amendments to better clarify the invention and address all instances of indefiniteness raised in the Office Action.

Withdrawal of this rejection is therefore respectfully requested.

VI. Rejections under 35 USC §102

Claims 23 and 24 were rejected under 35 USC §102(b) as being anticipated by Schembri. Regarding this rejection, the Office Action alleges that Schembri

discloses an analytical device that comprises all of the features recited in these claims.

By the present Amendment, Applicants have cancelled claims 23 and 24, thereby rendering this particular ground of rejection moot.

VII. Rejections under 35 USC §103

Claims 1, 4, 5, 8-10, 13-16, and 26 were rejected under 35 USC §103(a) as being unpatentable over Schembri in view of Bedingham. Regarding this rejection, the Office Action indicates that Schembri discloses a microfluidic structure that is provided with means for introducing fluid therein. The Office Action admits that Schembri fails to explicitly disclose a dispenser or any other device specifically configured for making holes in the microfluidic structure. This feature, however, is indicated as being well known in the art.

Bedingham is relied upon for disclosing a rotational micro-fluidic structure having a plurality of containers covered by a sealing layer, as well as a piercing tool configured for making holes in the cover of the rotating structure. The Office Action concludes that it would have been obvious to provide a sealing cover in the modified apparatus of Schembri in order to provide a clean environment for the test procedures, and in order to gain more control over fluid flow by providing additional inlets or outlets when needed. Applicants respectfully disagree.

By the present Amendment, Applicants have amended the claims to better clarify the invention and incorporate features that are not believed to be shown or suggested by the art of record. As amended, independent claim 1 defines an extractor that comprises a structure body having an extracting device and a hole forming device, with the structure body being supported in a rotatable manner. The

extracting device includes a capturing portion that captures specific chemical components from a specimen, and a plurality of reagent containers that hold the liquid flowing to the capturing section. According to independent claim 1:

said plurality of reagent containers which are connected to said capturing section comprise a liquid outlet port which is provided at a side opposite to a rotation center, namely an outer periphery side, during rotation of said structure body;

said capturing section is held in said extracting device, closer to an outer periphery side than said plurality of reagent containers; and

said reagent container comprises said liquid outlet port which is provided on said opposite side to said rotation center and a bent flow path portion which returns to said rotation center from said liquid outlet port, a most inner periphery portion of said bent flow path portion positioned at an outer periphery side from a most inner periphery portion of said reagent container, said reagent container is sealed with a cover which is enabled to form a hole, at a state before the hole in said cover is made, said reagent container communicates to an outside portion of said reagent container only at said liquid outlet port, and which at a particular stage prevents a flow of liquid from said reagent containers which are connected to said capturing sections, and at another stage, forms said liquid flow due to a centrifugal force from a rotation of said extracting device, and a vent hole is formed to a cover for sealing said reagent containers using said hole forming device.

The extractor independent claim 1 includes a plurality of reagent connectors that are connected to the capturing section and include a liquid outlet port that is provided at a side opposite to the rotational center of the structure body during rotations. The capturing section is held in the extracting device closer to an outer periphery side than the plurality of reagent containers. Each reagent container includes the liquid outlet port which is provided on the opposite side of the rotation center and a bent flow path portion which returns to the rotation center from the liquid outlet port. A most inner periphery portion of the bent flow path portion is positioned at an outer periphery side from a most inner periphery portion of the

reagent container. The reagent container is sealed with a cover which is capable of accommodating a hole at a state prior to the hole being made. The reagent contained also communicates to an outside portion thereof only at the liquid outlet port. As a particular stage, the bent flow path portion prevents the flow of liquid from the reagent containers that are connected to the capturing sections, while at another stage, the bent flow path portion forms the liquid flow through a centrifugal force from rotation of the extracting device. Additionally, the flow path is provided with a vent hole that is formed in the cover for sealing the reagent containers using the hole forming device.

Thus, according to the present invention, when the serum separation is completed, the serum 318 is stored in the storage container 313, and the hole forming device 13 forms one hole in each vent hole cover of the reagent containers. Next, the motor rotates so that the reagents can flow out due to the centrifugal forces. See paragraph [0059]. However, it is not possible for the reagent to flow prior to forming the hole in the vent hole covers. This arrangement eliminates the need for incorporating additional valves in the passage where the reagent will flow, thereby reducing costs and complexity. Furthermore, by providing the bent flow path portion, it is possible to prevent the pressure in the reagent container from becoming lower than the saturation vapor pressure. Thus, it is possible to prevent the liquid reagent from transforming to a gaseous phase wherein the reagent would flow out even under high-speed rotations.

Contrary to the present invention, Schembri discloses an analytical rotor that includes a holding chamber having a single exit duct and a receiving chamber connected to the holding duct through the exit duct. The exit duct prevents flow at a first rotational speed, while allowing flow at a second rotational speed which is higher

than the first rotational speed. Additionally, the exit duct can also include a capillary passage which prevents the flow by capillary forces until the rotational speed is increased. Contrary to the present invention, Schembri does not utilize a vent hole, but relies on the capillary flow. Furthermore, the bent flow path portion of the present invention has a most inner periphery portion that is positioned toward the outer periphery side than the most inner periphery portion of the reagent container. In Schembri, however, the most inner periphery portion of the bent flow path portion is not at the outer periphery side more than the most inner periphery portion of the reagent container. Consequently, it is only possible for Schembri to transfer the reagent by capillary flow. Applicants further note that the analytical rotor of Schembri allows air to freely enter into the vessel (42) from the upstream side. Consequently, it is not possible to prevent the liquid within the vessel from flowing to the path side by capillary flow or centrifugal force.

Bedingham discloses a sample processing device wherein samples of different materials can be located within a plurality of process chambers in the device. The device is subsequently rotated during heating of the sample materials. While Bedingham appears to disclose a tool in the form of a syringe needle that can be used to seal or form a barrier over the process chamber, this tool differs from the hole forming device of the present invention. Specifically, the tool of Bedingham is designed to deposit or remove liquid to and from the process chamber. There is no disclosure or suggestion for utilizing this tool to form a hole which would allow the liquid in the vessel to become fluidized as set forth in independent claim 1. The cited references simply fail to provide any disclosure or suggestion for features now recited in independent claim 1, such as:

said reagent container comprises said liquid outlet port which is provided on said opposite side to said rotation center and a bent flow path portion which returns to said rotation center from said liquid outlet port, a most inner periphery portion of said bent flow path portion positioned at an outer periphery side from a most inner periphery portion of said reagent container, said reagent container is sealed with a cover which is enabled to form a hole, at a state before the hole in said cover is made, said reagent container communicates to an outside portion of said reagent container only at said liquid outlet port, and which at a particular stage prevents a flow of liquid from said reagent containers which are connected to said capturing sections, and at another stage, forms said liquid flow due to a centrifugal force from a rotation of said extracting device, and a vent hole is formed to a cover for sealing said reagent containers using said hole forming device.

It is therefore respectfully submitted that independent claim 1 is allowable over art of record.

Claim 26 depends from independent claim 1, and is therefore believed allowable for at least the reasons set forth above with respect to independent claim 1. In addition, this claim introduces novel elements that independently render it patentable over the art of record.

By the present Amendment, Applicants have amended independent claims 5 and 10 to incorporate various features that have now been incorporated into independent claim 1. Accordingly, independent claims 5 and 10 are now believed to be allowable over the art of record.

Claim 9 depends from independent claim 5, and is therefore believed allowable for at least the reasons set forth above with respect to independent claim 5. In addition, this claim introduces novel elements that independently render it patentable over the art of record.

Claims 14 and 15 depend from independent claim 10, and are therefore believed allowable for at least the reasons set forth above with respect to

independent claim 10. In addition, these claims each introduce novel elements that independently render them patentable over the art of record.

VIII. Conclusion


For the reasons stated above, it is respectfully submitted that all of the pending claims are now in condition for allowance. Therefore, the issuance of a Notice of Allowance is believed in order, and courteously solicited.

If the Examiner believes that there are any matters which can be resolved by way of either a personal or telephone interview, the Examiner is invited to contact Applicants' undersigned attorney at the number indicated below.

AUTHORIZATION

Applicants request any shortage or excess in fees in connection with the filing of this paper, including extension of time fees, and for which no other form of payment is offered, be charged or credited to Deposit Account No. 01-2135 (Case: 503.43983X00).

Respectfully submitted,
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Dated: July 20, 2009